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ABSTRACT

This supplement to the "K-12 Physical Education Curriculum Guide," developed by the Department of Education in Manitoba, Canada is composed of four sections. The first section briefly discusses the concept of physical fitness and the purposes and objectives of a physical education program directed toward developing physical well being. The physiological principles and foundations of physical fitness are outlined in the second section. The third section deals with testing and evaluating students for physical fitness and skill. The final section lists information sources, references, resource packages, and teaching aids. (JD)

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the physical fitness objective in physical education

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THE PHYSICAL FITNESS OBJECTIVE

IN PHYSICAL EDUCATION

A Supplement to the K-12

Physical Education Curriculum Guide

Manitoba Department of Education

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THE PHYSICAL FITNESS OBJECTIVE IN PHYSICAL EDUCATION

A. INTRODUCTION

Definition

A commonly used and acceptable definition of physical fitness is the ability to adapt and perform daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure time pursuits, meet unforeseen emergencies, and enhance physical well-being.

Rationale

Physical fitness development provides a sound foundation for the total fitness of an individual. The Canadian Association for Health, Physical Education and Recreation (C.A.H.P.E.R.) and Participaction have jointly produced a booklet entitled What's the Matter with Kids Today? This booklet outlines the physical and mental consequences of inadequate physical education programs. It also includes positive recommendations to improve physical education programs.

Purpose

The purpose of the physical fitness objective within the total physical education program is to provide a sound foundation to enhance the achievement of all the physical education objectives, including neuro-muscular skills, creative movement, and emotional and social development.

Objectives

The Manitoba K-12 Physical Education Curriculum Guide outlines specific physical fitness objectives and progressions under the major learning goal of: DEVELOP PHYSICAL WELL-BEING. A basic understanding of the interrelationship of the physical fitness objectives with the major curriculum objectives should provide meaningful information to assist the teacher in planning a physical education program to meet the individual needs and interests of the students. Table 1 presents a "blueprint" for the discussion of these interrelationships.

TABLE 1

Classifications of Physical Education Objectives
into Program Components (Outcomes)

Physical Fitness	Neuro-muscular	Emotional	Social
Basic - cardiovascular endurance - muscular strength - muscular endurance - flexibility Health Related - body composition - % fat - weight - posture Lifestyle Factors - nutrition - rest and relaxation - stress management - smoking - etc.	Motor Fitness - speed - power - agility - reaction time - balance - coordination Motor Ability Perceptual Motor Development Sport Skills Rhythm and Dance Athletic Performance	Personal feelings towards physical activity based on knowledge (why) and experience (how) Aesthetics of Physical Activity Creative Aspects of Physical Activity Perceptual Development Etc.	Play Environment Socialization Experiences Spectator Demonstration Events Etc.

The basic components of physical fitness include cardiovascular endurance, muscular strength, muscular endurance, and flexibility. They provide a foundation for the development of physical motor fitness (speed, power, agility, reaction time, balance, and coordination). Motor fitness enables the student to participate in and develop specific skills in sports, rhythm, and dance activities. In order to successfully pursue this sequential development in a physical education program, the student must be motivated and physically educated. The provision of a wide variety of physical activities in a stimulating social environment enhances positive student motivation towards physical activity participation. The inclusion of the health-related concepts listed under the physical fitness objective provides insight as to how lifestyle affects the physical fitness status of an individual (e.g., smoking reduces breathing capacity).

B. PRINCIPLES AND FOUNDATIONS OF PHYSICAL FITNESS

The theory and practice of physical fitness encompass several areas of study, which identify the effects of physical activity on the human body and provide guidelines to effective programming of physical activities for various groups. These areas include: (1) energy production, delivery and utilization; (2) locomotor aspects of movement; (3) training principles; and (4) programming of physical activities. An understanding of the inter-relationship of these four areas by physical education teachers should provide the basis for the programming and practice of physical fitness. The concepts within each of the four areas are listed in Table 2. The following brief explanation of the concepts in each of the four areas, as outlined in Table 2, should provide the teacher with a "basic" understanding of the theory and practice of physical fitness.

1. Energy Production, Delivery and Utilization

Adenosine triphosphate (ATP) is the immediately usable form of chemical energy at the cellular level for muscular work. The ATP energy must be replenished to enable muscular work to continue. The replenishment of ATP occurs at two sites: (1) within the cell: phosphocreative (PC) and the anaerobic (no oxygen) source are utilized; and (2) throughout the cardiovascular respiratory system which supplies oxygen (aerobic energy) to the cells.

There is a simultaneous use of ATP and replenishment of ATP by the anaerobic and aerobic systems. The aerobic system supplies the majority of the energy in moderate physical work over a long period of time (e.g., walking, jogging), while the anaerobic system supplies the majority of the energy for physical activities that are very rapid over short periods of time (e.g., sprints).

2. Locomotor Aspects of Physical Activity

The basic and specific components of locomotion are utilized to initiate and perpetuate different forms and types of body movement. All of these components operate simultaneously during various types of movement (run, jump, turn, stop, etc.). In order to gain an understanding of these components, each of the components listed in Table 2 will be discussed.

a) Neuromuscular Functions

i) Basic Components

- Strength: Strength is the maximum amount of tension a muscle or a group of muscles can produce. A basic amount of strength is required to initiate and continue movement of body segments and the whole body.

TABLE 2

Physical Fitness Concepts: Theory and Practice

AREAS →	ENERGY PRODUCTION, DELIVERY AND UTILIZATION	LOCOMOTOR ASPECTS OF PHYSICAL ACTIVITY	TRAINING PRINCIPLES AND GUIDELINES	PROGRAMMING OF PHYSICAL ACTIVITIES
C O N C E P T S ↓	Energy production and use in body cells: - ATP-PC - Anaerobic Energy delivery by the cardiovascular-respiratory (CVR) system: - Aerobic Energy utilization during exercise	Neuromuscular functions: - Basic components: - strength - endurance - flexibility - Specific components: - speed - reaction time - power - agility - balance - coordination Physique: - Muscular and skeletal systems: - muscle types - Body composition: - percent fat - percent lean body mass (L.B.M.) - Body types: - ectomorph - endomorph - mesomorph - Male vs. female	Physiological F.I.T.T. Principle: - Frequency (F) - Overload (ITT) - intensity - time-amount - type - Specific guidelines for each physical fitness component Safety procedures: - Warm-up - Warm-down - Body temperature regulation Lifestyle habits Body mechanics rules: - Total body movement - Lifting objects	Classification of physical activities Physical fitness program guidelines: - Main ingredients of a successful physical fitness program: - determine the needs - How to select appropriate physical activities - Guides to progression and maintenance of a physical fitness program
Conceptual Analogy of a Car	Engine	Body and Wheels	Driving Rules	Good Trips and Roadways

- Endurance: Muscular endurance is the ability of a muscle or a muscle group to continue doing repetitive work for a long period of time.

- Flexibility: Flexibility is the range of movement of muscle joints. It is also the question of suppleness (ease of movement) of various muscle-joint segments of the body.

ii) Specific Components

- Speed: Speed is the capacity of the individual to perform successive movements of the same pattern at a fast rate.

- Reaction Time: Reaction time is the length of time required to initiate a movement in response to a stimulus (light, sound, pressure, verbal command, etc.).

- Power: Muscle power is the rate of doing work. Maximum power is the highest rate of doing work. It can be demonstrated in a standing broad jump for maximum distance or a vertical jump for maximum height.

- Agility: Agility is the ability to change directions quickly while moving. Physical activities such as tennis and handball require good agility.

- Balance: Body balance is the ability to maintain control of the body and body parts in a stationary or moving situation in various positions.

- Coordination: Coordination is the ability to integrate fine and gross movement patterns efficiently. A well-coordinated individual makes movement patterns appear to be easy to perform and thus is efficient in body mechanics with the minimal amount of energy use. Hand-eye and foot-eye physical activities are specialized coordination movements.

b) Physique

The study of body physique (muscular and skeletal systems, body composition, body types, and male vs. female) provides an understanding of the variations in potential development in the general and specific components of physical fitness. Also, the aspect of weight control needs to be emphasized.

3. Training Principles and Guidelines

a) Physiological F.I.T.T. Principle

The F.I.T.T. (Frequency, Intensity, Time, Type) Principle is a general training slogan. A brief explanation of the F.I.T.T. Principle follows.

i) Frequency (F): This involves the time span between bouts of physical activity to enable the body to adapt and improve the basic or specific fitness components inherent in the physical activity program. A frequency of 3-5 times a week with a 24-48 hour time interval between the workouts adheres to the F rule.

Physical activities that are performed at an intensity of 50-80% of maximum effort (e.g., cardiovascular and muscular endurance, flexibility) can be done on a daily basis or every second day, to achieve a training effect. However, a frequency of 5 times a week will elicit a greater training effect than 3 times a week.

Physical activities that are performed at an intensity of over 80% of maximum effort (e.g., strength training involving 1-8 maximum repetitions) should be performed every second day to achieve the best training effect.

The guidelines for determining the appropriate time span between physical activity workouts is the intensity level of performance. Low and moderate intensity work can be done daily, while high intensity work should be done every second day to allow for full recovery from fatigue and a preparation of a peak "energy readiness" of the body.

ii) Overload (ITT): This involves increasing the amount of work to be done above a level that the body has become accustomed to do. The three variables of the overload rule include:

- Intensity (I) or "how hard" is the physical activity?
- Time (T) or "how long" is the physical activity?
- Type (T) or "what kind" of physical activity is being performed? (Table 3, P. 11)

The section on the "Specific Guidelines for Each Physical Fitness Component" explains the overload (ITT) principle in more detail.

iii) Specific Guidelines for Each Physical Fitness Component

- C.V.R. Endurance (aerobic)

Participate in physical activities that involve the large muscle groups of the body (e.g., swimming, cross-country skiing, jogging).

The exercise heart rate per minute should be maintained within the training threshold zone (T.T.zone). The T.T. zone is 70-85% of maximum heart rate. As a general rule of thumb, maximum heart rate is around 220 minus age in years. For a 15-year individual, his/her T.T.zone would be between 144 (70% of 205) and 174 (85% of 205) heart beats per minute during exercise. A 10 or 15 second pulse count immediately after stopping the exercise approximates the exercise heart rate quite closely.

Exercise should be performed from 15-60 minutes in length (Table 5, P. 16) to stimulate a training effect. For practical purposes, two sessions per day may be feasible (e.g., two - 8 minute or 15 minute sessions). Additional time may be suggested as "homework".

- Muscle Strength, Power and Endurance

The development of muscle strength, power and endurance involves doing repetitive movements against a resistance. The form of activity could be calisthenics using the body weight as a resistance or the use of weight training equipment such as weights or machines (universal gym, etc.).

A simple method that you can use to determine if the exercise is most specific to muscle strength, power or endurance development is to count the maximum number of repetitions that can be performed. If the maximum number of repetitions is between 1 and 8, it is classified as a strength exercise; 9-16 repetitions is classified as a power exercise; and 17-24 repetitions is a muscle endurance exercise. This can be called the "progressive 8" repetition system of muscle strength, power and endurance training.

- Flexibility

The best and safest way to apply the overload principle in flexibility training is to actively (use your own muscle effort) move the body segment (arm, leg, etc.) slowly against the force of gravity or against a resistance through the full range of motion and hold the end position for a few seconds, before another repetition is done.

- Coordination and Balance

Coordination and balance development involve the imprinting of neuro-muscular movement patterns similar to a computer instruction program. Repeating specific movement patterns or holding positions (balance) on a regular basis for an extended period of time trains the neuro-muscular learning tracts, which then enable the individual to perform the specific skill "almost" automatically in reaction to various responses (e.g., handball, figure skating).

- Speed, Reaction Time, Agility

A basic level of development should occur in these locomotor components if one performs and follows the guidelines for the other specific components (strength, endurance, etc.). However, if the objective is to develop the specific qualities of any or all of these aspects (speed, reaction time, agility), it can be done by repeating intervals of the specific movement patterns 5-10 times at approximately 85-95% of maximum intensity rate to elicit a training effect (e.g., sprint training).

b) Safety Procedures to Ensure Optimum Application of the Physiological Training Rules

i) Warm-up and Warm-down

Use a slow, gradual warm-up and warm-down to ensure the best use of the aerobic energy system. This will also minimize the accumulation of fatigue and ensure the most efficient movement of the body, as well as enabling the body to recover from fatigue more rapidly.

ii) Body Temperature Regulation

At rest, the body temperature is about 37°C (98.6°F). During exercise, the body temperature increases due to an increase in body metabolism. Some increase in body temperature is useful because it speeds up the efficiency of body energy use and regeneration, as well as improving physical efficiency during movement. However, if the body temperature rises too high, two problems are created: (1) extra blood from the working muscles is diverted to skin surface to carry excess body heat to the outside environment in the form of sweating; and (2) an extra physiological stress is placed on the body energy systems which can result in impairment (e.g., cardio-vascular collapse) or even death.

Some basic safety rules for proper body temperature regulation during exercise include:

- Wear light clothing that allows for evaporation of sweat from the skin surface while exercising. Do not wear impermeable clothing such as plastic or rubberized sweat suits.

- Protect your head from excessive sunlight radiation by wearing head gear (cap, hat). Sun or heat strokes could result from excessive exposure to direct sunlight.

- Refrain from doing heavy physical work or activity during hot, humid weather conditions. It may be best for you to do your physical activity in the early morning or late evening, when the weather is not hot and humid.

- Ensure that you have an adequate intake of fluids (water) to avoid dehydration, due to sweat loss during exercise.

c) Lifestyle Habits

The practice of prudent lifestyle habits (nutrition, rest, relaxation, stress management, avoidance of smoking, etc.), along with adherence to the F.I.T.T. Principle, should optimize the achievement of the physical fitness objectives.

d) Body Mechanics Rules

i) Total Body Movement

- Use the full range of movement of the body's muscles and joints to ensure the best use of elastic energy (mechanical energy) and efficient free flowing coordinate movements. This would include using a rolling, heel-toe action during walking and jogging. Wear proper-fitting and well-supported footwear, and run or walk on surfaces that absorb your impact.

- Keep in close contact with the surface (ground, floor) to maintain the centre of gravity in a straight line with a minimum or "up and down" fluctuation.

- Avoid excessive rotation movements in the hips, lower back, shoulders and neck areas.

- Lean into the direction that you are moving. Lower your body weight while stopping or turning.

- While jumping, keep your body segments in a straight line and direct your force in the line of your destination.

- While maintaining a stationary ("ready") position, keep your ankles, knees, hips, shoulders in a straight line and at the same height on both sides (i.e., do not drop a hip or shoulder).

ii) Lifting Objects

- Stand close to the object that you want to lift with a wide base established by your feet.

- Keep your back straight while bending your knees and hips as far as you need to. Avoid deep knee bends. Lift the load with your leg muscles, which are the strongest in your body.

- Distribute the weight evenly on both sides of your body.

- Pushing or pulling the object is easier than lifting a heavy weight. This can be done most efficiently by rotating the object away from its centre of gravity.

- Do not rotate your spine while lifting or carrying a weighted object.

4. Programming of Physical Activities to Meet the Physical Fitness Objective

a) Classification of Physical Activities

The general approach to classifying types of physical activities involves two categories. The first category relates to the type of energy system (anaerobic - (AN) or aerobic - (A)) that is predominantly used during the physical performance of the activity. As you increase the rate (low to high) in the performance of the activity, the energy source shifts from the aerobic to the anaerobic system.

The second category relates to the form of movement (isometric-static (S) or isotonic-dynamic (D)) involved in the physical activity. Isometric-static forms of work involve the development of muscle tension with no actual movement of the body or its individual limbs. Isotonic-dynamic forms of work involve the shortening (concentric) and lengthening (eccentric) of the muscle groups to generate movement of the body or individual limbs of the body. The low intensity work in both static and dynamic work utilizes energy primarily from the aerobic system, but with increased intensity and resistance, the energy needs source shifts to the anaerobic system.

This classification of physical activities into these four combinations (AD, AS, AND, ANS) can be used as a guide to enable an individual to correctly select and safely perform a balance of physical activities related to needs, interests, age, sex and fitness status (Table 3).

The low fit individual should select and perform activities mainly from aerobic-dynamic combination (walk, jog, stretch, light calisthenics). After several weeks of gradual progression using the F.I.T.T. principle of training, the individual can start adding activities from the other combination categories, especially the AND. A moderate functional physical fitness level can be developed and maintained by using activities only from the AD category; however, if the individual has specific job or recreation pursuits and interests, more intensive activities from the AND and ANS can be performed gradually.

b) Physical Fitness Program Guidelines

i) Introduction

The regular involvement in a variety of physical activities in a formal or recreational setting is a basic life necessity for positive health enhancement by everyone, regardless of age, sex or ability. There are many bonus benefits that can be derived from participating in a purposeful physical activity lifestyle program. Some of these benefits include: feeling better, having a better self-esteem, more energy and less fatigue, better sleep and relaxation, and many others related to the physical, mental and social aspects of health. The key is to learn to enjoy the physical activity habit, as well as reaping the benefits of better health.

TABLE 3

Four Physical Activity Categories

AEROBIC-DYNAMIC A.D.	AEROBIC-STATIC A.S.
✓C.V.R. endurance +- run, walk, swim	✓Muscle endurance + light isometrics
✓Muscle endurance + calesthenics, light wt. tr.	+ push, and pull light objects
✓Flexibility + stretch and hold exercises	✓Sedentary states + sit + stand
ANAEROBIC-DYNAMIC **AND**	**ANAEROBIC-STATIC** **ANE**
✓Strength + heavy resistance wt. tr (4 - 8 reps) + heavy resistance univ. gym, etc. + heavy work	✓Strength + high intensity isometrics + heavy straining while attempting to lift, push or pull a resistance
✓Power, speed, agility + competitive sports	

Prescription of a physical fitness program (specific program for groups or individuals based on needs and interests) does not apply only to the sick, unfit, injured or disabled people. Anyone who follows the physical fitness program guidelines can be ensured that he/she will gain the best benefits from the program, as well as reduce or eliminate the undesirable side effects such as injury, exhaustion, fear of failure in physical tasks, and others.

The F.I.T.T. Principle should be used throughout the K-12 continuum to ensure progressive development and maintenance of physical fitness. In the early years, the F.I.T.T. Principle can be programmed in some aspects of the movement education, low organized games and perceptual-motor learning programs where the basic physical and motor fitness components are involved. In the middle and senior high years, the F.I.T.T. Principle should be appropriately applied to develop "specific fitness" in the sports skill and dance (e.g., aerobic dance) programs. Some manipulation of physical fitness resource packages (P. 21) and other sources should be done to adhere to the F.I.T.T. Principle.

ii) Main Ingredients of a Successful Physical Fitness Program

- Determine the needs. The basic criteria to determine your physical activity needs include:

  Present level of health - A medical examination may be advisable and useful, but everyone can be, and needs to be, physically active regardless of the degree of disability or functional health impairment.

  Present physical fitness level - Fitness testing and counselling are part of a physical education program. The application of the F.I.T.T. Principle and common sense should enable one to embark on a safe progression in a physical activity program. Remember, the basic tasks of daily living and work involve physical effort of various intensities and types of movement. The application of the F.I.T.T. Principle can make one aware of physical performance needs for daily living, as well as minimizing fatigue and injury occurrence.

  Age and sex - Some physical activities may be more appropriate and common for specific age and sex groups, but most physical activities can be modified to suit the needs and interests of all age and sex groups. This is particularly useful to utilize the social benefits of physical activity.

  Interests - The physical activity program that you undertake must fit your own interests based on past, present, and future positive experiences in physical activity. Build up an inventory of interesting (motivating) physical activities best suited to individual needs, as well as a variety of creative physical recreation outlets that may not have a specific fitness value, but are self-satisfying.

iii) How to Select Appropriate Physical Activities

The basic concepts of (1) the energy system; (2) basic locomotor aspects; (3) training principles and guidelines; and (4) classification of physical activities have been presented. Using this background information, you can plan the program.

As students learn the why's and how's of physical activity, they will develop the ability to select the appropriate physical activities to get the balanced needs of a basic program.

Physical activity in various forms can contribute to the development of physical fitness. The "fitness values" of activities, sports, training programs and exercise equipment presented in Table 4 should provide the teacher with more guidelines on selecting a balance of physical activities.

iv) Guides to Progression and Maintenance of a Physical Fitness Program

The explanation of the F.I.T.T. Principle, with specific application to each of the physical fitness components (pages 5-9), provides the "principles and rules of exercise" to develop physical fitness. In programming the physical fitness objectives, various conceptual techniques can be utilized to meet the objectives. Some examples of conceptual techniques include:

- Nutrition - Physical Activity Analogy

A regular physical activity program can be compared to a regular (daily, weekly, etc.) eating pattern. In your eating "program", you need to: (1) select a variety of foods from the four basic food groups (milk, meat, breads and cereals, and fruits and vegetables); (2) eat a sufficient number of kilocalories to balance your energy output and avoid excess intake of food; and (3) develop a habit of enjoying various foods based on need, as well as enjoyment by such avenues as exotic cooking practices or dining out in specialty restaurants.

In a basic physical activity program, you need to: (1) partake in a balance of physical activities for physical fitness development, progress gradually in the intensity and amount of physical activity, to ensure the optimum development and maintenance of physical fitness; and (2) learn to appreciate and use the benefits of your physical activity program for life enrichment by enjoying recreational pursuits of various forms.

A simple quantitative method of learning to adopt a prudent physical activity habit is illustrated in Table 5, with a foregoing discussion.

TABLE 4

Physical Fitness Values (L-low, M-medium, H-high)
of Activities, Programs and Exercise Equipment

	C.V.R. Endurance	Muscular Endurance	Flexibility	Strength
Jogging	H	H-legs	M-legs	M-legs
Cycling	H	H-legs	M-legs	H-legs
Swimming	H	H-arms & shoulders	M-arms & shoulders	M-arms & shoulders, chest
Water Exercise	H	H	H	M
Walking	M	M	L	L
Golf	L	M-legs	M-shoulders, back	M-shoulders, back
Soccer	H	H-legs	M-legs	M-legs
X-C ski	H	H-legs M-arms, shd.	M-legs, arms, shoulders	H-legs M-arms, shoulders
Bowling	L	L	M-arms, shoulders	L
Tackle Football	L	M	M-legs, arms	M
X BX & 5BX	M	H	M	M
Aerobics	H	M-legs	M-legs	M-legs
Circuit Training	H	H	H	H
Interval Training	H	H-legs	M-legs	M-legs

A summarization of the basic rules to follow in the progression and maintenance of a purposeful physical activity program includes:

(1) Each physical activity session should include a gradual stretching warm-up and warm-down. The energy expenditure during the warm-up and warm-down is in addition to the total amount of energy (work done) expenditure shown in Table 5 (Samples I, II and III).

(2) In the low-fit category (Table 5, Sample I), the major type of physical activity is the aerobic-dynamic (AD), which stimulates the development of C.V.R. endurance by participating in activities such as walking, jogging and swimming, with light calisthenics and stretching exercises included. No heavy straining or intensive high rate of activity should be done at this level.

(3) As one progresses (body adapts) to the average fitness level, one can do more total physical activity (Table 5, Sample II), as well as increase the intensity of the work rate. The AD type of activity is still the predominant portion of the program; however, one can now safely undertake recreational sports such as tennis. The goal may be to stay and maintain this level of physical activity participation, because one will have achieved a desirable functional fitness level for most of the daily energy requirements.

(4) However, if one wants to be able to enjoy competitive sports, a progression to a high fitness level (Table 5, Sample III) is essential.

- Physical Activity Related to Lifestyle

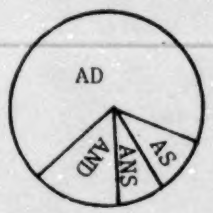
It is difficult to maintain a regular physical activity because of boredom, daily living pressures, and many other reasons. To improve one's chances of continuing a purposeful daily lifestyle of physical activity, a total developmental approach is useful to optimize the development of total fitness (emotional, mental and physical).

As one learns more (knowledge and experience positive changes) about the benefits of physical activity towards improving total fitness, one will be able to deal with potential health problems in a positive, preventative way. For example, one can learn to recognize "stress signals" from the body and take proper steps to alleviate the consequences of accumulated stress, by learning to do combined mental, physical and emotional effort in activities involving stretching and relaxation. Become more aware of your nutrition (N), attitude (A), feeling of the moving body (M) and the environment (E) that surrounds you. Conscious thought and concern of the interrelationships of these life elements (N.A.M.E.) may enable one to become a "whole person", by making appropriate lifestyle changes to improve well-being.

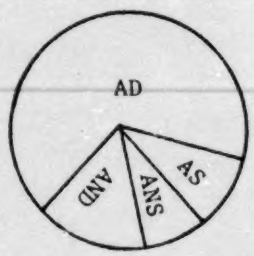
TABLE 5

Physical Activity Requirements: Ingredients and Amounts

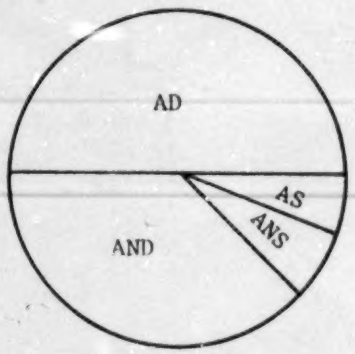
Fitness Level:	Low	Average	Above Average
Amount:	Low (100 K.cal)	Medium (300 K.cal)	High (500 K.cal)
Time:	15 to 30 min.	20 to 40 min.	30 to 60 min.
Ingredients:	Sample I	Sample II	Sample III



Sample I



Sample II



Sample III

KEY: P.A. Sample Ingredients (See Table 3, page 11)

A.D. - (Aerobic-Dynamic) e.g., swim, jog, walk, skip rope

A.S. - (Aerobic-Static) e.g., stretch and hold, sit, stand

AND - (Anaerobic-Dynamic) e.g., weight lifting, handball, sprints

ANS - (Anaerobic-Static) e.g., straining and holding, isometric exercises

Amount Interpretation:

The proportional amount of the required types of physical activities is portrayed by the "serving portion" within each of the 3 Samples, which represent 3 physical fitness levels. Note that the AD "serving portion" is over half of the total amount of physical activity energy expenditure in all 3 Samples. The reason for this is that the AD physical activities stimulate the development of C.V.R. endurance (aerobic) fitness, the most important component of physical fitness.

C. EVALUATION

1. Purpose

The main purpose of physical fitness evaluation is to determine the progression levels of the students in various aspects of fitness and apply the results to an ongoing program.

2. Types of Tests

Physical fitness evaluation can be done by:

a) Teacher observation in a physical activity setting.

b) Self-directed testing by students under appropriate guidance.

c) The use of standardized tests which usually measure basic physical and motor fitness, as well as some health related items (Table 1, P. 2).

The most appropriate tests that should be used at the present time include:

i) Manitoba Physical Fitness Performance Test Manual and Fitness Objectives, Manitoba Department of Education, 411 - 1181 Portage Avenue, Winnipeg, Manitoba, R3G 0T3 (1977).

A computerized evaluation program called ManFit has been developed to be used with this manual.

ii) The CAHPER Fitness - Performance II Test Manual, Canadian Association for Health, Physical Education and Recreation, 333 River Road, Ottawa, Ontario, K1L 8B9 (1980).

iii) The Canada Fitness Awards Program (CFAP) standards are based on the norms of the CAHPER Performance II Test Manual. A computerized program called Fitnesc, which calculates the raw data of the CFAP, is available from the Manitoba Department of Education.

d) Specific physical fitness tests related to sport and dance skills. The usual approach is to have the students perform movement patterns such as flexibility, power, agility, speed and endurance that are specific to the skill.

3. Test Administration Procedures

The students should have some familiarization with the test items before the test is administered, to allow them to become mentally and physically prepared.

It is important that the instructions for the test items are followed very closely.

The adherence to these two procedures should minimize measurement errors.

4. Interpretation and Application of Test Results

The performance standards (norms) in published test manuals are usually presented in percentile scales. The percentile scale depicts a range of performance from zero (0) to the one hundredth (100) percentile of the specific population that was evaluated.

The interpretation of a student's performance involves two decisions:

a) The student's present level of performance. If the student scores at the 40th percentile, he/she has scored better than 39% of the population of the test manual.

b) The desired level of performance for the student to achieve in an ongoing program. The desired level of achievement should be a standard that most students can reach. For example, the Manitoba Schools' Physical Fitness Test (ManFit) program has established desired levels of performance ranging from the 60th to 85th percentile on several items (agility, sit and reach, sit-ups, flexed arm hang, and a timed running distance).

The key is to motivate and program physical activities that may enable the students to reach their objectives. A very important feature is that the desirable standards described in the Manitoba Schools' Physical Fitness Program represent only about 50 to 60 percent of potential development in each of the physical fitness test items. It is important that the percentile score is not misinterpreted as part of a potential development scale. For example, a percentile score of 50 for the sit-ups test may represent only 25% of potential development for that student. This fact is important because the desired levels of achievement can be reached by most of the students. The Canada Fitness Awards Program has a range of standards for various awards. The top awards standard may be in the 95th percentile range. It is important that there is adequate preparation by the students before the test is administered, to enable the participants to work for realistic goals.

Test results should be kept confidential as much as possible, to enable students to progress at their own levels. Public display of results may discourage students from taking tests and result in negative attitudes toward physical activity.

Composite scores (averages of several test items) should be avoided. An individual profile (e.g., Manitoba Schools' Physical Fitness Test) for each of the test items ensures that weak areas are emphasized and strong areas are maintained.

D. REFERENCES, RESOURCE PACKAGES AND TEACHING AIDS (FILMS, ETC.)

1. Specific References

a) Allsen, P., Harrison, J., and Vance, B. Fitness for Life: An Individualized Approach. Dubuque, Iowa: Wm. C. Brown, 1976.

b) Ardell, D. High Level Wellness: An Alternative to Doctors, Drugs, Disease. Emmaus, Pennsylvania: Rodale Press, 1977.

c) Burke, E. (Editor). Toward an Understanding of Human Performance. Ithaca, New York: Movement Publications, 1977.

d) Cooper, K. The Aerobics Way. New York: Bantam Books Inc., 1978.

e) Corbin, C., and Lindsey, R. Fitness for Life. Glenview, Illinois: Scott, Foresman & Co., 1979.

f) de Vries, H. Physiology of Exercise for Physical Education and Athletics. 3rd ed. Dubuque, Iowa: Wm. C. Brown, 1980.

g) Farquahar, J. W. The American Way of Life Need Not Be Hazardous to Your Health. Palo Alto, California: Stanford Alumni Press, 1978.

h) Fox, Edward L. Sports Physiology. Toronto: W. B. Saunders Co., 1979.

i) Klappholz, Lowell (Editor). Successful Practices in Teaching Physical Fitness, Part II. Old Saybrook, Connecticut: Physical Education Publications, 1974.

j) Kuntzleman, Charles T., and Kuntzleman, Beth A. Fitness With Fun. Spring Arbor, Michigan: Arbor Press, 1978. (Published for the National Board of the Y.M.C.A. - Cardiovascular Health Program.)

k) Miller, D. K., and Allen, T. E. Fitness: A Lifetime Commitment. Toronto: Burgess, McAinsh & Co. Ltd., 1979.

l) Morehouse, Lawrence, and Gross, Leonard. Total Fitness in Thirty Minutes a Week. New York: Simon and Schuster, 1976.

m) Pollock, Michael L., et al. Health and Fitness Through Physical Activity. New York: John Wiley and Sons, 1978.

n) Pruden, Bonnie. Fitness from Six to Twelve. New York: Harper and Row, 1972.

o) Shannon, W. T., et al. Elementary School Heart Health Education Series (five booklets). Published by the Nova Scotia Heart Foundation. For copies write to: William T. Shannon, Ed.D., Division of Health Education, Dalhousie University, Halifax, Nova Scotia, B3H 3T5 (1980).

The titles of the five booklets are:

- Cardiovascular Fitness
- Nutrition and Heart Health
- Tobacco and Health
- Anxiety, Relaxation and the Heart
- Alcohol and Lifestyle

p) Sharkey, B. Physiology of Fitness. Champaign, Illinois: Human Kinetics Publishers, 1979.

q) Shephard, R. J., and Lavallee, H. (Editors). Physical Fitness Assessment: Principles, Practice and Application. Springfield, Illinois: Charles C. Thomas, 1978.

r) Stewart, Gordon W. Every Body's Fitness Book. Toronto: Doubleday Canada Ltd., 1980.

s) Wallis, E. L., and Logan, G. E. Exercise for Children. Englewood Cliffs, N. J.: Prentice-Hall Inc., 1966.

2. Supplemental Articles and Materials

a) Australian Science Education Project (A.S.E.P.). The Human Machine (Teacher Edition). Melbourne, Australia: C. H. Rixon, Government Printer, 1974. (#ISBN 0 7241 3061 6)

b) C.A.H.P.E.R. The National Report on New Perspectives for Elementary School Physical Education Programs in Canada. Ottawa: Canadian Association for Health, Physical Fitness and Recreation, 1979. pp. 17-20. (Presented by School Physical Programs Committee)

c) C.A.H.P.E.R. What's the Matter with Kids Today? Ottawa: Canadian Association for Health, Physical Education and Recreation, 1979.

d) Clarke, H. H. (Editor). Physical Fitness Research Digest. 1, No. 1 (1971). (Published quarterly by the President's Council on Physical Fitness and Sports, Washington, D. C., 20202)

e) Clarke, H. H. (Editor). Physical Fitness Research Digest (Physical Fitness Practices and Programs for Elementary and Secondary Schools). 6, No. 4 (1976).

f) Collis, Dr. Martin L. Moving into the Teens. Rev. ed. Ottawa: Fitness and Amateur Sport, Government of Canada, 1980.

G) Gutin, Bernard. A Model of Physical Fitness and Dynamic Health. Washington, D. C.: American Alliance for Health, Physical Education, and Recreation, 1980. pp. 48-51.

h) National Coaching Development Program. Coach's Manual, Level I: Theory. Winnipeg: Fitness, Recreation and Sport, 1979. pp. 59-95. (302 - 379 Broadwey)

3. Resource Packages

Available from: Curriculum Services (Physical Education)
Manitoba Department of Education
411 - -181 Portage Avenue
Winnipeg, Manitoba
R3G 0T3 Telephone: 786-0268

- Fitness As Simple As A-B-C, 1979

- Training Methods, 1980

- Daily Physical Education and Physical Fitness Programs, 1980

- Physical Fitness Activities, 1977

- Section Four: Primary Games Modified Towards Fitness, 1978

- Elementary Fitness Concepts and Activities, 1976

- Manitoba Physical Fitness Performance Test Manual and Fitness Objectives, 1976

4. Teaching Aids

- Manitoba Physical Education and Recreation Instructional Media (1980) (contains lists of available video tapes, films, books, and printed matter) Available from the above address.

- Fit to Sing (Record) by Martin Collis - Available from:

Phactory Phresh Phitness Corp.
2415 Alpine Crescent
Victoria, British Columbia
V8W 2Y2